



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/856,150

08/03/2001

Sung Tae Yang

P66658USO

9223

7590

10/17/2005

Yoon S. Ham, Esq.  
Piper Rudnick LLP  
P.O. Box 9271  
Reston, VA 20195

EXAMINER

PERILLA, JASON M

ART UNIT

PAPER NUMBER

2638

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/856,150

Applicant(s)

YANG ET AL.

Examiner

Jason M. Perilla

Art Unit

2638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-8 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-8 are pending in the instant application.

#### ***Response to Amendment***

2. The Applicant's amendments received August 1, 2005 in response to the *Ex Parte Quayle* action filed June 1, 2005 have been entered into the case.
3. The indicated allowability of claims 1-8 made in the *Ex Parte Quayle* action is withdrawn in view of the new rejections based on Applicant's Admitted Prior Art in view of Gitlin et al (US 5442625).

#### ***Claim Objections***

4. Claims 1-5, 7, and 8 objected to because of the following informalities:  
Regarding claim 1, in line 16, "the encodable data rate" should be replaced by –an encodable data rate--.  
Regarding claim 3, in line 3, "input signal" should be replaced by –the input signal--.  
Regarding claim 7, in lines 1-2, "a data rate of the input signal" should be replaced by –a data rate of each of the plurality of input signals--.  
Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, and 6-8 rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Admitted Prior Art (AAPA) in view of Gitlin et al (US 5442625; hereafter "Gitlin" – previously cited).

Regarding claim 1, the AAPA discloses according to figure 1 and pages 1-4 a code division multiple access (CDMA) transmit modulator (fig. 1) comprising a channel encoder (110) for convolutionally encoding (111) an input signal from a vocoder with symbol repetition (112) and interleaving (113); a channel modulator (120) for combining an output signal from said channel encoder and a second orthogonal code signal (122) distinguishing one from another traffic channel; a pair of pseudo noise (PN) combiners (130), each for combining the respective output signals of said channel modulator and a respective one of a pair of pseudo noise signals (PN\_I, PN\_Q) which have a predetermined offset in phase; a pair of lowpass filters (140), each for filtering a respective output signal of said pair of PN combiners and flattening the power level of its output signal; and an analog signal modulator (190) for converting output signals of said pair of lowpass filters to an RF signal.

The AAPA does not disclose, in a CDMA transmit modulator, an apparatus for obtaining multiple subchannels within a traffic channel, comprising: (1) a plurality of subchannel encoders substituted for said channel encoder, (2) a plurality of subchannel modulators; and (3) a subchannel summer for summing output signals of said plurality of the subchannel modulators and providing the summed signal to said channel modulator.

However, Gitlin teaches according to figure 2, (1) a plurality of subchannel encoders, each for convolutionally encoding (201, 221, and 241) and interleaving (202, 222, and 242) input data from a respective one of a plurality of subchannels, a data rate of each of the plurality of subchannels being lower than an encodable data rate of the traffic channel by said channel encoder (col. 3, lines 15-30); (2) a plurality of subchannel modulators (204, 224, and 244), each for combining an output signal from a respective one of said plurality of subchannel encoders and respective first orthogonal code signals (C1, C2, and CM) distinguishing one from another subchannel, all subchannels being accommodated in a single traffic channel (the channel output of the MOBILE UNIT 200); and (3) a subchannel summer (254) for summing output signals of said plurality of the subchannel modulators and providing a summed signal. Gitlin teaches that the division of the single channel into a plurality of subchannels provides a radio transmitter to dynamically change its source data rate (col. 1, lines 45-50). Further, the division of the single user input of Gitlin (USER SOURCE 1) into a plurality of subchannels *each having* encoding and subchannel modulation allows *each of the subchannels to remain orthogonal* to each of the remaining subchannels. That is, *the number of available orthogonal channels increases*. Gitlin describes that by using CDMA, a unique binary spreading sequence is assigned to each user (i.e. from a mobile unit 200). In the case of the combination of Gitlin in view of the AAPA, not only would the channels from the individual transmitters or mobile units be orthogonal, but

Art Unit: 2638

there would be subchannels within each orthogonal channel which are further orthogonal to each other. Hence, the number of available orthogonal channels is increased. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to replace the channel encoder of the AAPA with three analogous channel encoders and add three respective subchannel encoders as taught by Gitlin in the apparatus of the AAPA because it could lead advantageously to additional available subchannels and a flexible data rate system.

Further, it is obvious that a bit rate of the respective first orthogonal code signals are lower than that of the second orthogonal code signal. This is due to the fact that the first orthogonal code signal needs to provide orthogonality between subchannels having a data rate of only  $1/N$  times ( $N$  = the number of subchannels) the summed data rate of all the subchannels. Once the subchannels are summed, the bit rate of the second orthogonal signal must necessarily be greater because it is required to provide orthogonality between all the subchannels provided in the single channel transmitted from the MOBILE UNIT 200. Hence, a greater bit rate is required.

Regarding claim 2, the AAPA in view of Gitlin disclose the limitations of claim 1 as applied above. Further, Gitlin discloses that the data rate of each of the plurality of subchannels is  $N$  times lower than a predetermined data rate of input signal that is inputted to said channel encoder,  $N$  being the number of said subchannel encoders (col. 3, lines 16-26).

Regarding claim 3, the AAPA in view of Gitlin disclose the limitations of claim 1 as applied above. Further, Gitlin discloses that the data rate of said orthogonal code signal defining a subchannel is equal to a predetermined data rate of the input signal that is inputted to said channel modulator (col. 4, lines 20-30).

Regarding claim 6, the AAPA in view of Gitlin disclose the limitations of claim 6 as applied to claim 1 above.

Regarding claim 7, the AAPA in view of Gitlin disclose the limitations of claim 6 as applied above. Further Gitlin discloses that the data rate of the input signal is N times lower than the data rate defined for the resultant combined signal, N being the number of said plurality of input data (col. 3, lines 16-26).

Regarding claim 8, the AAPA in view of Gitlin disclose the limitations of claim 6 as applied above. Further Gitlin discloses that in the embodiment of figure 4, a symbol repeater is utilized so that the chip rate is constant (col. 4, lines 1-10). Therefore, it is obvious, as applied above in the rejection of claim 6, that encoding (201, 221, and 241), symbol repetition (col. 4, lines 1-10), and interleaving (202, 222, 242) are performed independently in the embodiment of figure 2. Thereby, the bit rate of the first orthogonal code signal is equal to the data rate defined for the resultant combined signal (col. 4, lines 20-30).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the AAPA in view of Gitlin as applied to claim 1 above, and further in view of Odenwalder et al (US 6298051; hereafter "Odenwalder" – previously cited).

Regarding claim 5, the AAPA in view of Gitlin disclose the limitation of

Art Unit: 2638

claim 1 as applied above. The AAPA in view of Gitlin do not disclose that the subchannel summer reduces the energy of the subchannel data of each or all of the plurality of subchannels. However, Odenwalder teaches a high data rate CDMA system having multiple subchannels wherein the gain of each of the subchannels is modified as they are combined (fig. 3, refs. 108; col. 4, lines 50-65). Odenwalder teaches that the gain can be properly adjusted for each subchannels so that interference is reduced and total transmit capacity is increased. Therefore, it would have been known to one having ordinary skill in the art at the time which the invention was made to utilize a subchannel summer wherein the energy of the subchannels may be gain adjusted (reduced) as taught by Odenwalder in the apparatus of the AAPA in view of Gitlin because it could mitigate interference and increase transmit capacity.

#### ***Allowable Subject Matter***

8. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone



Art Unit: 2638


number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jmp



**KENNETH VANDERPUYÉ**  
**SUPERVISORY PATENT EXAMINER**



Jason M. Perilla  
October 5, 2005